

# Computing System

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## Topics

- Requirements
- Criteria for hardware and software
- Software
- Data Flow
- Hardware components
- Conclusion

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# Requirements

- Read from digitizer 10MB/sec/crystal
- Perform signal decomposition and tracking
- Store processed data (4TB/5days) and keep 2 weeks
- Movable - minimal support effort
- High Availability
- Can be met with today's hardware, almost

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# Criteria

- Off-the-shelf
- Familiar
- Expect to leverage effort of lab support
- Flexible (Specifics will undoubtedly change)
- Movable
- Upgrade path

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# Types of Software

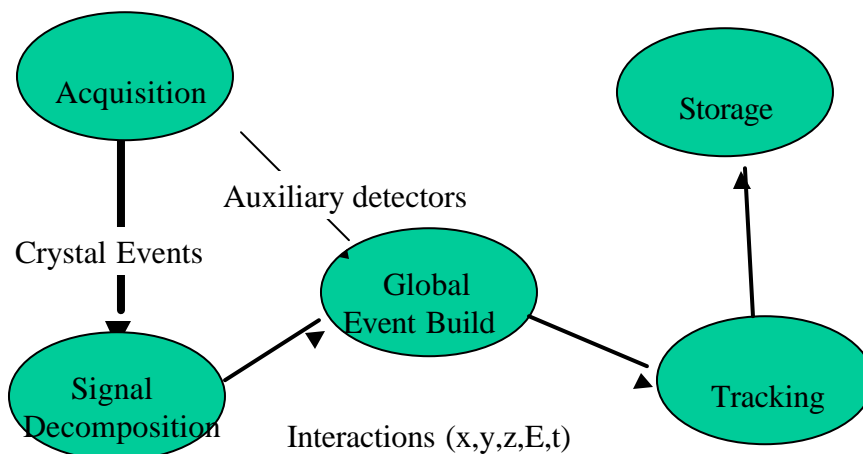
- Real-time
  - Readout detectors
  - Time-sort results and forward for processing
- Tracking & Decomposition Computation
- Slow Controls (EPICS)
- Operating Systems - R/T and Linux

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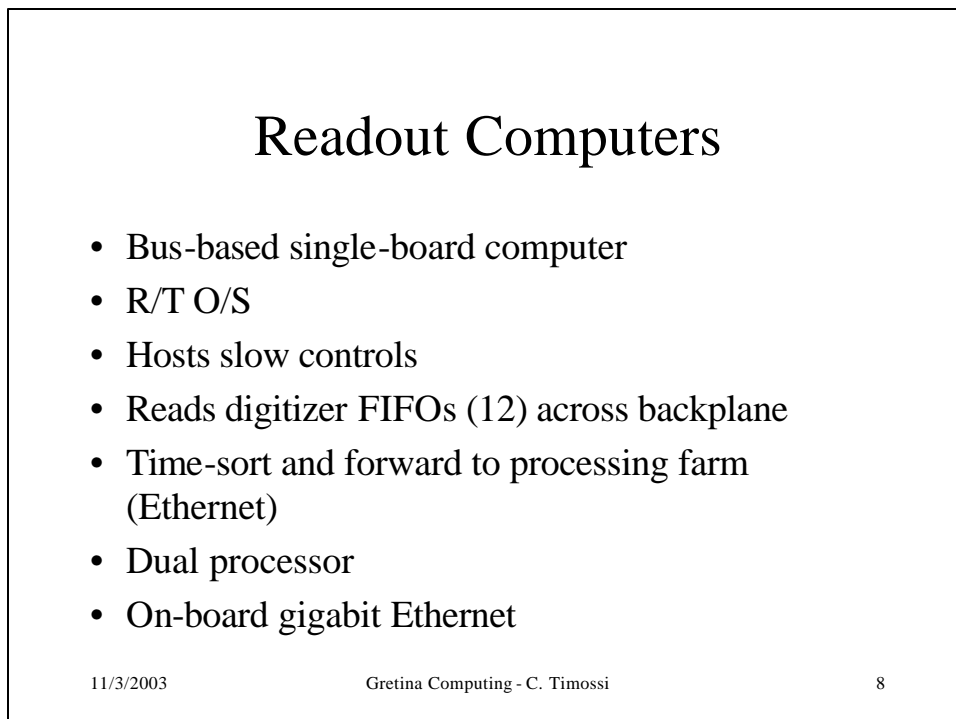
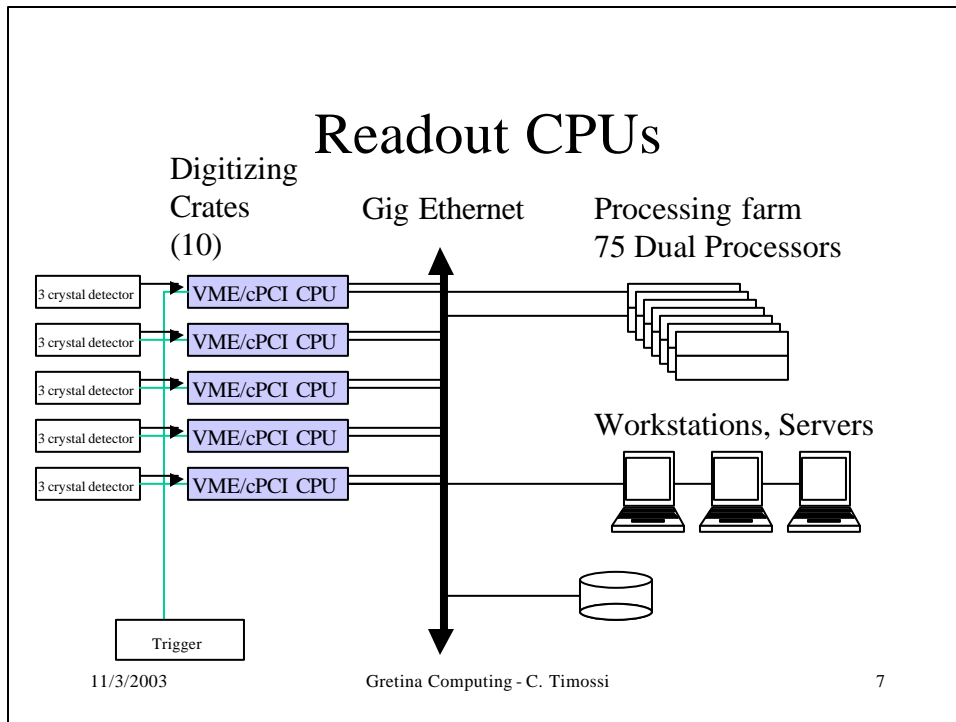
## Dataflow

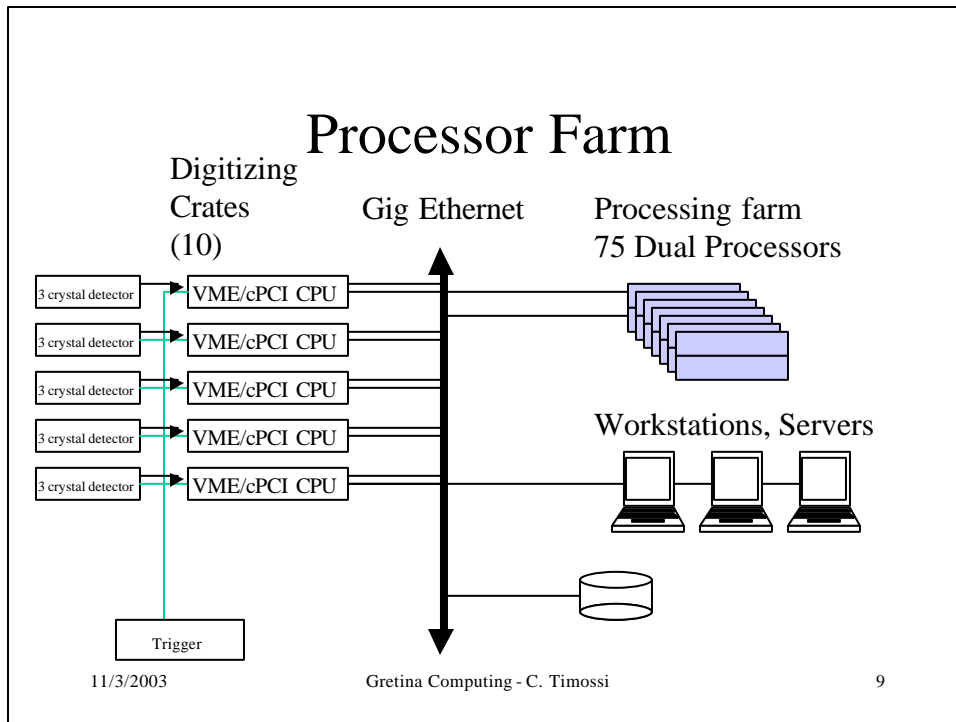


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# Processor Farm

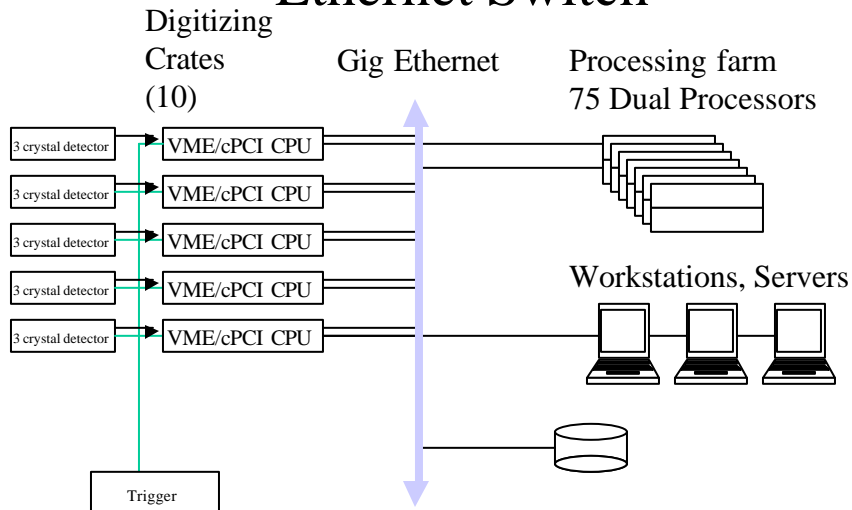
- 150 CPUs
- Need more power than available today
- Packaging options (decide later)
  - 75 Dual processor 1U computers w. Ethernet
  - Blades

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# Ethernet Switch



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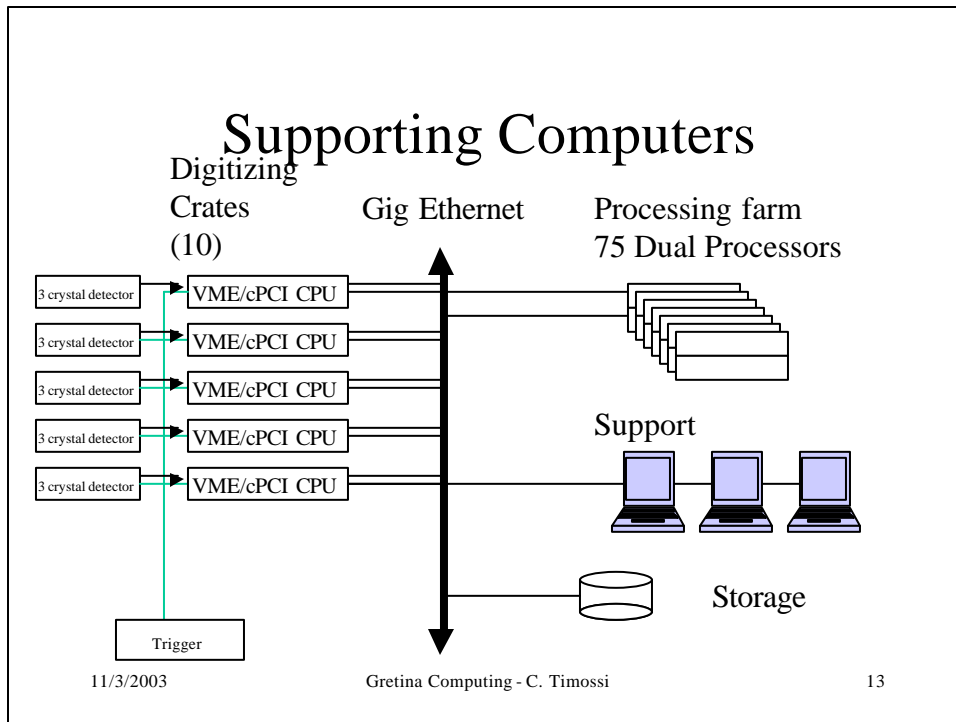
## Network

- 300 MB/sec from readout to farm
- 10 MB/sec farm to storage
- Gigabit Ethernet switch (64 Gb/sec) available now
- Cost will decrease 20% capacity will double

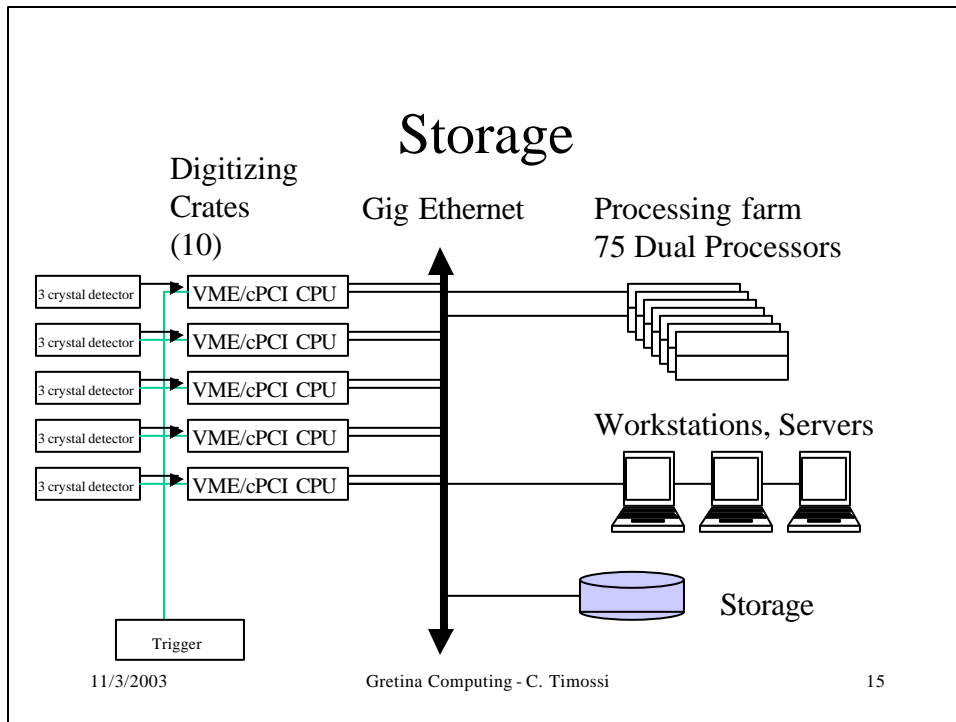
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- # Supporting Computers
- Data analysis
  - Slow controls (e.g. histograms)
  - Development (building software)
  - Application Server
  - Storage for source code
  - Data export
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## Data Storage

- 4TB / 5 days (keep 2 weeks) => 8TB
- Write 10MB/sec
- High Availability / Security
- Network attached storage is one solution
- Export Data
  - User takes it home: portable hard drives
  - User sends it home: FTP



## Slow Controls

- Allow control and monitoring of experiment
  - Less than 10,000 control points (knobs)
- Logging
- Alarm handling
- Configuration database

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## Conclusion

- We're in good shape
- Off-the-shelf hardware means low risk
- Specify/buy computer hardware as late as reasonable
- Software tools are available now

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